REMARKS

The March 27, 2006, Office Action (hereinafter "Office Action") rejected Claim 10 under 35 U.S.C. § 112, second paragraph, as being vague and indefinite. Claims 1-10, 13, 15-27, and 31-40 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of U.S. Patent No. 5,729,463, to Koenig et al., (hereinafter "Koenig") and U.S. Patent No. 6,487,525, to Hall et al., (hereinafter "Hall"). Claims 11, 12, 14, 28-30, 41, and 42 were rejected under 35 U.S.C. § 103(a) as being unpatentable in view of Koenig, Hall, and U.S. Patent No. 6,452,209, to Hill et al. (hereinafter "Hill").

Pursuant to 37 C.F.R. § 1.111, and for the reasons set forth below, applicants respectfully traverse the rejections and request reconsideration and allowance of the pending claims. Prior to presenting the reasons why the applicants believe that the pending claims are in condition for allowance, a brief summary of the disclosed subject matter and brief descriptions of the teachings of the cited references are provided. These summaries, however, are presented solely to assist the Examiner in recognizing the differences between the pending claims and the cited references, and should not be construed as limiting on the disclosed subject matter.

Brief Description of Claimed Subject Matter

The claimed subject matter is directed to an improved system and method for generating frame designs for the manufacture of vehicles. According to the provided system and method, a specification regarding components to be mounted onto a vehicle frame is obtained. This specification includes a plurality of components to be configured to the frame. Each component identified in the specification is associated with at least three pieces of data: (1) location information corresponding to a starting position for configuring the component to the frame; (2) a range of additional positions at which the component can be configured to the frame; and (3) three-dimensional data corresponding to a tessellated representation of the component.

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Once the specification is obtained, components are iteratively selected and configured to the frame. In particular, for each selected component, the component's logical starting position is set for the component and a determination is made as to whether the selected component interferes with any component already configured to the frame. As long as the selected component interferes with another component already configured to the frame, the position of the selected component is set to another position within the range of additional positions specified for the component. Once a position is set for the selected component that does not interfere with other components already configured to the vehicle frame, the selected component is configured to the frame at the current position.

Another aspect of the disclosed subject matter relates to positioning components to the vehicle frame that further correspond to holes or openings that exist for the purpose of allowing a component to be attached to the frame.

Advantageously, having a starting position, range of positions, and three-dimensional data regarding the component enables the system to automate the process of locating components on a vehicle frame in an efficient manner and ensure that the components will fit in concert with one another, all within the constraints that are placed upon each component.

Brief Description of Koenig (U.S. Patent No. 5,729,463)

Koenig is purportedly directed to designing lightweight automobile bodies. In particular, Koenig discloses designing automobile bodies such that they meet certain performance goals. Koenig, Abstract. This design process includes selecting performance targets including such information as static torsion, bending, and vibration targets. The type of materials to be used are also selected. Koenig, Col. 2, lines 36-41. Apparently, at each step of development, performance targets are evaluated such that the design only proceeds once target elements are met.

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While Koenig generally discloses designing a vehicle using a computer system, Koenig fails to disclose or teach obtaining processing data **for each of the plurality of components** that "includes location information corresponding to **a logical starting position** for attempting to locate a component on the frame and **a range of additional positions** to locate the component and **three-dimensional data corresponding to a tessellated representation of the component**," as recited in the independent claims. As acknowledged in the Office Action, Koenig also fails to disclose determining whether a component interferes with other components according to the three-dimensional data for the component, and modifying the component according to the range of additional positions to find a position where the component does not interfere with other components already configured to the vehicle frame.

Brief Description of Hall (U.S. Patent No. 6,487,525)

Hall is purportedly directed to designing a HVAC assembly for a climate control system on a vehicle. In particular, after a user selects a particular HVAC architecture, the Hall system incorporates components required by the architecture and integrates them into the vehicle system.

Hall also purportedly discloses determining if the HVAC assembly interferes with other parts of the vehicle or meets particular clearances, particularly with the vehicle body, and modifies the location of the assembly, and/or the shape of its components, when there is an interference.

While Hall purportedly discloses checking for interferences and modifying positions when an interference is encountered, Hall fails to disclose obtaining processing data for each of the plurality of components that "includes location information corresponding to **a logical starting position** for attempting to locate a component on the frame and **a range of additional**

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positions to locate the component and three-dimensional data corresponding to a tessellated representation of the component," as recited in the independent claims.

35 U.S.C. § 112, Second Paragraph, Rejection

The Office Action asserted that the phrase "pieces of geometry" is vague and indefinite. In view of the specification, applicants respectfully disagree.

Applicants submit that the phrase "pieces of geometry" can be interpreted as a physical, three dimensional shape of an object/component (or the items that make up the component). While not explicitly defined in these words, applicants suggest that one of ordinary skill in the art would readily appreciate this definition of "pieces of geometry" in view of the specification. Applicants particularly point to the following passages in the specification for support of this definition: page 2, lines 5-7; page 5, lines 2-4; page 14, lines 10-19; and page 15, lines 16-18.

As applicants believe that "pieces of geometry" is definite in view of the specification, applicants request that the 35 U.S.C. § 112, second paragraph, rejection of Claim 10 be withdrawn.

35 U.S.C. § 103(a) Rejections over Koenig and Hall

The Office Action rejected Claims 1-10, 13, 15-27, and 31-40 as being unpatentable in view of Koenig and Hall. For the reasons set forth below, applicants respectfully traverse the rejections.

Claim 1

In regard to Claim 1, applicants submit that Koenig and Hall, alone and in combination, fail to disclose or teach each element of this claim. In particular, applicants submit that the cited references fail to disclose:

> obtaining processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the

processing data for each of the plurality of components includes location information corresponding to a logical starting position for attempting to locate a component on the frame and a range of additional positions to locate the component and three-dimensional data corresponding to a tessellated representation of the component;

determining whether the tessellated representation of the selected component located at the current position interferes with the tessellated representation of any other components already configured to the frame; *and*

if an interference occurs, setting a next position in the range of additional positions defined in the processing data as the current position for the selected component and repeating (d).

Applicants submit that Koenig fails to disclose obtaining information for each component that includes a starting position, a range of additional positions should the starting position interfere with another component, and three-dimensional tessellated data of the component for use in determining whether the component interferes with other already-configured components. The Office Action cites to Koenig, Col. 6, lines 59-61, as disclosing these three elements of processing data associated with each component. Applicants disagree. This passage of Koenig simply states that a "beam model analysis provides the locations and dimensions of the various components for the body-in-white." While this passage suggests that the system is aware of components and their locations, applicants note that (a) the analysis is performed after the parts are assembled, not before, and (b) fails to disclose obtaining processing information that includes a starting location, a range of additional positions, and three-dimensional tessellated data.

Applicants further submit that Hall fails to disclose the iterative selection and configuration of components to the vehicle frame, as recited in Claim 1. In particular, applicants submit that Hall fails to disclose, for each selected component as it is to be configured to the vehicle frame, "determining whether the tessellated representation of the selected component located at the current position interferes with the tessellated representation of any other components already configured to the frame." Applicants submit that both Hall and Koenig fail

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to disclose iteratively selecting components, initially placing each selected component to the frame according to a logical starting position identified in associated information for the component, and determining whether the tessellated representation of the selected component interferes with a tessellated representation of an already-configured component. While Hall may disclose checking for general component interference, Hall fails to disclose checking for interference based on tessellated representations.

Applicants yet further submit that Hall fails to disclose the iterative selection and configuration of components in regard to repositioning selected components, particularly "if an interference occurs, setting a next position in the range of additional positions defined in the processing data as the current position for the selected component and repeating (d)," as recited in Claim 1. The Office Action cites to Hall, Col. 7, lines 1-9, as disclosing this element. Applicants disagree. This passage suggests that **after** the system generates the HVAC assembly from its components, the system checks for component interference. In particular, applicants point to Hall, Figure 3, block 140, that states "Generate HVAC Assembly" prior to checking for package violations in block 150. Indeed, Hall fails to disclose or teach, for each selected component, as the selected component is configured to the frame, iteratively to the frame, determining whether an interference occurs, and if so, selecting another position from the range of positions in the processing data associated with the selected components. Applicants submit that an *en masse* evaluation of an assembly is patentably distinct from the iterative process described in Claim 1.

For the reasons set forth above, applicants submit that Koenig and Hall, alone and in combination, fail to teach or suggest each element of Claim 1. Applicants submit that a proper, *prima facie* case of obviousness is found only when each element of the rejected claim is found in the cited combination of references. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580

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(C.C.P.A. 1974). As applicants submit that a *prima facie* case of obviousness cannot be made with regard to Koenig and Hall, applicants request that the 35 U.S.C. § 103(a) rejection be withdrawn, and the claim allowed.

Claims 2-10, 13, and 15-16

As applicants submit that Claim 1 is in condition for allowance over the cited references Koenig and Hall, applicants submit that dependent Claims 2-10, 13, and 15-16 are also in condition for allowance. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). Applicants therefore request that the 35 U.S.C. § 103(a) rejections of Claims 2-10, 13, and 15-16 be withdrawn and the claims allowed.

In addition to depending from Claim 1, Claims 2-10, 13, and 15-16 include additional elements that further distinguish them from the cited and applied references. Some of these are discussed below.

Claim 9

Applicants submit that Koenig and Hall fail to disclose the following elements of Claim 9:

> determining whether the selected component fits with any existing holes on the frame for attaching a component at the current location; and
>
> if no interference occurs, configuring the selected component to the frame at the position corresponding to a matching hole.

With regard to the recitation "determining whether the selected component fits with any existing holes on the frame for attaching a component at the current location," the Office Action cites to Hall, Figure 2 and Col. 7 as disclosing this recitation. Applicants disagree. Indeed, Figure 2 appears to illustrate the components of an HVAC assembly, but completely fails to disclose whether or not any of the illustrated components would fit "with any existing holes on the frame for attaching a component at the current location." Moreover, while Col. 7 appears to

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generally suggest conducting distance and/or clearance checking for the entire HVAC assembly, nothing in Col. 7 discloses or teaches the positive recitation of "determining whether the selected component **fits with any existing holes on the frame** for attaching a component at the current location," as recited in Claim 9.

Applicants submit that nothing in Hall suggests determining whether a selected component would fit within a hole in the frame for mounting purposes. As such, Hall must also fail to disclose determining if the selected component would interfere with another component with respect to the hole in the frame, and if no interference is found "configuring the selected component to the frame at the position corresponding to a matching hole."

In view of these additional reasons, applicants submit that Koenig and Hall, alone and in combination, fail to disclose and/or teach each element of Claim 9. Accordingly, applicants request that the 35 U.S.C. § 103(a) rejection be withdrawn, and the claim allowed.

Claims 17-27, and 31-32

Independent Claim 17 recites similar elements to those now found in Claim 1, and was rejected for essentially the same rationale. However, in view of the reasons set forth above, applicants submit that Claim 1 is in condition for allowance. Accordingly, for the same reasons as above, applicants submit that Claim 17 is also in condition for allowance, and request that the 35 U.S.C. § 103(a) rejection be withdrawn and the claim allowed.

Claims 18-27 and 31-32, being dependent from Claim 17, are also in condition for allowance over the cited references, and request that the rejections be withdrawn and the claims allowed.

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Claims 33-40

Independent Claim 33 recites similar elements to those found in Claims 1 and 17. In particular, Claim 33 recites:

> a processing data module for storing processing data corresponding to each of the plurality of components to be mounted on the frame of the vehicle, wherein the processing data includes location information corresponding to a logical starting position for attempting to locate a component on the frame and a range of additional positions to locate the component and three-dimensional data corresponding to a tessellated representation of the component; and
>
> a configuration module for configuring a location for a selected component of the plurality of components to be mounted on a frame of a vehicle based upon an interference check corresponding to comparison of a tessellated representation of the selected component interferes with the tessellated representation of any other components already configured to the frame.

As already discussed above, applicants submit that Koenig and Hall, alone and in combination, fail to disclose and/or teach processing data including a logical starting position, a range of additional positions, and three-dimensional data corresponding to a tessellated representation of the component. Moreover, applicants submit that Koenig and Hall, alone and in combination, further fail to disclose and/or teach interference checking for each selected component (prior to its configuration to the frame) with other components already configured to the frame, and determining "whether a tessellated representation of the selected component interferes with the tessellated representation of any other components already configured to the frame."

As Koenig and Hall, alone and in combination, fail to disclose and/or teach each element of Claim 33 (as discussed above), applicants submit that Claim 33 is in condition for allowance, and request that the 35 U.S.C. § 103(a) rejection of this claim be withdrawn and the claim allowed.

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Claims 34-40 depend from independent Claim 33, and are submitted to be in condition for allowance as well.

35 U.S.C. § 103(a) Rejections over Koenig, Hall, and Hill

The Office Action rejected Claims 11, 12, 14, 28-30, 41, and 42 as being unpatentable in view of Koenig, Hall, and Hill. For the reasons set forth below, applicants respectfully traverse the rejections.

Claims 11, 12, and 14

Each of these claims depends from independent Claim 1, which applicants submit is in condition for allowance. Hill was relied upon as disclosing a tree structure of data and traversing said tree structure. Irrespective of whether or not Hill discloses these elements, applicants note that Hill fails to disclose or teach the elements of Claim 1 that are lacking in regard to the combination of Koenig and Hall as discussed above. Accordingly, applicants submit Claims 11, 12, and 14 are in condition for allowance, and request that the 35 U.S.C. § 103(a) rejections be withdrawn and the claims allowed.

Claims 28-30

As above, each of these claims depends from independent Claim 17, which applicants submit is in condition for allowance. Hill was relied upon as disclosing a tree structure of data and traversing said tree structure. Irrespective of whether or not Hill discloses these elements, applicants note that Hill fails to disclose or teach the elements of Claim 17 that are lacking in regard to the combination of Koenig and Hall as discussed above. Accordingly, applicants submit Claims 28-30 are in condition for allowance, and request that the 35 U.S.C. § 103(a) rejections be withdrawn and the claims allowed.

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Claims 41-42

As with the prior sets of claims, each of these claims depends from independent Claim 33, which applicants submit is in condition for allowance. Hill was relied upon as disclosing a tree structure of data and traversing said tree structure. Irrespective of whether or not Hill discloses these elements, applicants note that Hill fails to disclose or teach the elements of Claim 33 that are lacking in regard to the combination of Koenig and Hall as discussed above. Accordingly, applicants submit Claims 42-42 are in condition for allowance, and request that the 35 U.S.C. § 103(a) rejections be withdrawn and the claims allowed.

CONCLUSION

In light of the above, applicants submit that the pending claims are in condition for allowance and respectfully request an early notice to that effect. The Examiner is invited to contact applicants' attorney at the number provided below should any questions or issues remain.

Respectfully submitted,

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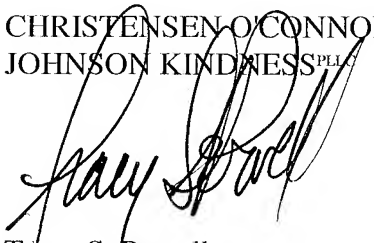

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